



Item 5.2: Recommendation Regarding 25RPG016 STEC Nueces Green Ammonia Load Interconnection Regional Planning Group (RPG) Project

*Kristi Hobbs
Vice President, System Planning and
Weatherization*

Board of Directors Meeting

April 20-21, 2026

Purpose

Provide an overview of the \$161.1 million STEC Nueces Green Ammonia Load Interconnection Tier 1 Reliability Project. Per ERCOT Protocol Section 3.11.4.7 Tier 1 projects require Board endorsement.

Voting Items

ERCOT staff requests and recommends that the Board of Directors (Board) endorse the STEC Nueces Green Ammonia Load Interconnection RPG Project (Option 3) based on North American Electric Reliability Corporation (NERC) and Electric Reliability Council of Texas, Inc (ERCOT) reliability planning criteria.

Key Takeaways

- Ensuring ERCOT's leadership for grid reliability and resilience, the Project has completed RPG review and received an independent assessment from ERCOT staff and unanimous endorsement by the Technical Advisory Committee (TAC).
- ERCOT studied several options and recommends Option 3 as it addresses all project needs with no reliability violations, is the least cost option, improves long-term load-serving capability and requires the least amount of CCN miles.

STEC Nueces Green Ammonia Load Interconnection RPG Project

STEC submitted the Nueces Green Ammonia Load Interconnection Project for Regional Planning Group (RPG) review in June 2025.

The purpose of the project is to address the reliability issues due to proposed load additions in Nueces County in the South Weather Zone.

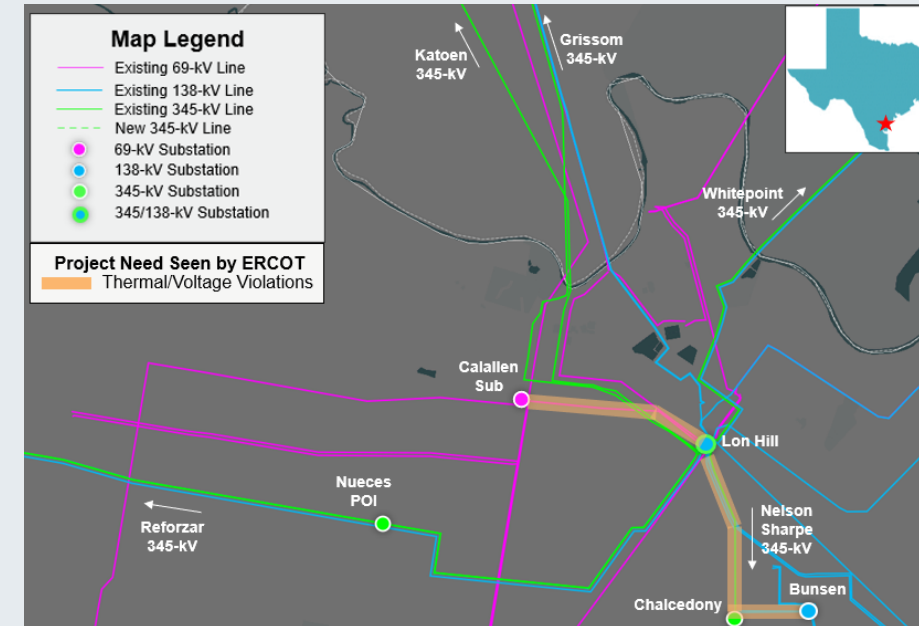
ERCOT performed an independent review of the project and identified thermal overloads and unsolved power flows in Nueces County.

ERCOT's endorsement of the project is based on the reliability need to relieve **thermal overloads** on ~3 miles of 138-kV, ~2 miles of 69-kV transmission lines and 2 **unsolved power flows** in Nueces County to meet NERC and ERCOT reliability planning criteria.

ERCOT presented the project and TAC voted unanimously to endorse the project on March 25, 2026.

Key Takeaway: The STEC Nueces Green Ammonia Load Interconnection Project has completed RPG review and received unanimous endorsement by TAC.

Thermal Overloads Seen by ERCOT



Basis for ERCOT Board Endorsement

ERCOT's independent review identified a reliability need for the STEC Nueces Green Ammonia Load Interconnection Project (Option 3) to satisfy:

NERC TPL-001-5.1 Table 1 Reliability Criteria for category:

- P0, P1, P3 and P6-2 contingencies

ERCOT Planning Guide Section Reliability Performance Criteria contingency:

- 4.1.1.2(1)(a): The contingency is a loss of a common tower outage
- 4.1.1.2(1)(d): The contingency is a loss of a single generator followed by a single transmission element or common tower outage
- 4.1.1.2(1)(e): The contingency is a loss of a single transformer followed by a single transmission element or common tower outage

Key Takeaway: The STEC Nueces Green Ammonia Load Interconnection Project (Option 3) is needed to meet reliability under NERC and ERCOT Planning Guide criteria.

Overall Project Summary

One (1) new 345-kV substation (Nueces Load Point of Interconnection (POI))

Construct approximately 4.5 miles of new 345-kV single-circuit transmission lines

Loop the existing Lon Hill to Grissom 345-kV transmission line into Nueces Load POI, approximately 5.9 miles

Rebuild of approximately 2.6 miles of 138-kV transmission lines

A Certificate of Convenience and Necessity (CCN) is needed for the construction of the looping in of the new Nueces Load POI 345-kV substation onto the existing 345-kV transmission line from the existing Grissom substation to the existing Lon Hill substation and for the new 345-kV transmission line from the planned Chalcedony substation to the new Nueces Load POI substation due to approximately 10.4 miles of new right of way (ROW).

Key Takeaway: The STEC Nueces Green Ammonia Load Interconnection Project (Option 3) will require a CCN due to approximately 10.4 miles of new ROW.

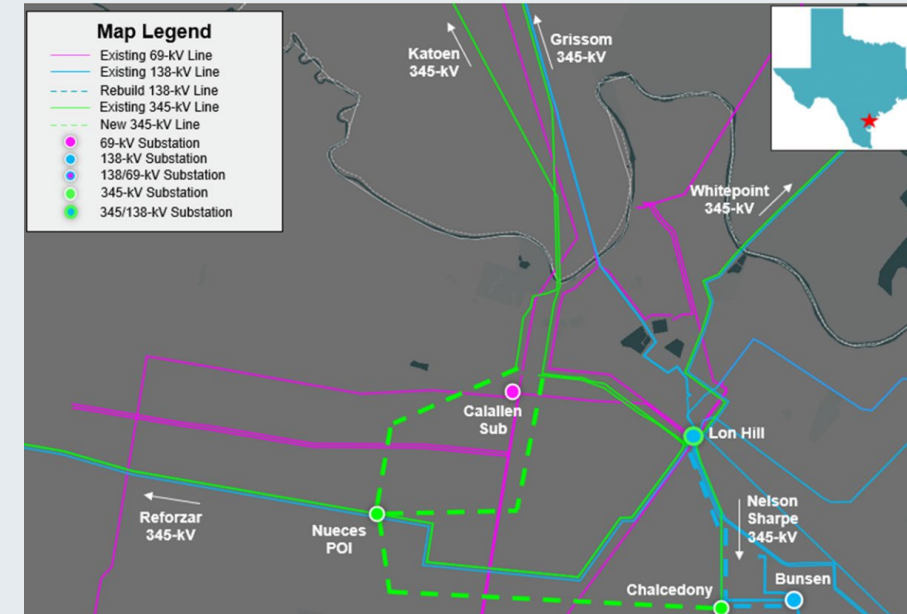
Request for Board Vote

ERCOT staff requests and recommends that the Board endorse the need for the STEC Nueces Green Ammonia Load Interconnection Project (Option 3) based on NERC and ERCOT reliability planning criteria.

The ERCOT Independent Review (EIR) is included as Attachment A to the Board Decision Template.

Key Takeaway: ERCOT studied several options and recommends Option 3 as it addresses all project needs with no reliability violations, is the least cost option, improves long-term load-serving capability and requires the least amount of CCN miles.

ERCOT Recommendation





Date: March 20, 2026
To: Board of Directors
From: Kristi Hobbs, Vice President, System Planning and Weatherization (ERCOT)
Subject: 25RPG016 STEC Nueces Green Ammonia Load Interconnection Project

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: April 20-21, 2026

Item No.: 5.2

Issue:

Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to endorse the need for the Tier 1 STEC Nueces Green Ammonia Load Interconnection Regional Planning Group (RPG) Project in order to meet the reliability requirements for the ERCOT System and address thermal overloads and unsolved power flows due to a proposed load addition in Nueces County in the South Weather Zone, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse.

Background/History:

STEC proposed the STEC Nueces Green Ammonia Load Interconnection Project in May 2025, a \$74.0 million, Tier 2 project with the expected in-service date of June 2027, to meet reliability planning criteria due to proposed load additions in Nueces County in the South Weather Zone. Protocol Section 3.11.4.6, Processing of Tier 2 Projects, requires ERCOT to independently review submitted projects. ERCOT performed an independent review of the STEC Nueces Green Ammonia Load Interconnection Project and identified thermal overloads and unsolved power flows in Nueces County. The ERCOT project recommendation (Option 3), a \$161.1 million, Tier 1 project with the expected in-service date of May 2031 addresses the need for a project under North American Electric Reliability Corporation (NERC) and ERCOT Planning Criteria to address thermal overloads on approximately 3 miles of 138-kV, 2 miles of 69-kV transmission lines and 2 unsolved power flows in Nueces County with the following ERCOT System improvements:



- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA respectively, approximately 5.9-mile;
- Construct a new Chalcedony to Nueces Load POI 345-kV transmission line on double-circuit structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, approximately 4.5-mile; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit structures with one circuit in place where not sharing a common tower, normal and emergency ratings of at least 400 MVA, approximately 2.6-mile.

ERCOT's independent review verified the reliability need for the STEC Nueces Green Ammonia Load Interconnection Project to satisfy ERCOT Planning Guide Section 4.1.1.2(1)(a), Reliability Performance Criteria, contingency for the loss of a common tower outage, 4.1.1.2(1)(d), Reliability Performance Criteria, contingency for the loss of a single generator followed by a single transmission element or common tower outage, and 4.1.1.2(1)(e), Reliability Performance Criteria, contingency for the loss of a single transformer followed by a single transmission element or common tower outage.

RPG considered project overviews during meetings in July 2025 and March 2026. Between July 2025 and March 2026, ERCOT staff presented scope and status updates at RPG meetings in July, October, November, December 2025, January, February and March 2026. Pursuant to paragraph (2) of Protocol Section 3.11.4.9, Regional Planning Group Acceptance and ERCOT Endorsement, ERCOT presented the Tier 1 project to the Technical Advisory Committee (TAC) for review and comment, and on March 25, 2026, TAC unanimously endorsed the project as recommended by ERCOT. Pursuant to paragraph (1)(a) of Protocol Section 3.11.4.3, Categorization of Proposed Transmission Projects, projects with an estimated capital cost of \$100 million or greater are Tier 1 projects, for which Protocol Section 3.11.4.7(2) requires endorsement by the Board. Pursuant to Section 3.11.4.9, ERCOT's endorsement of a Tier 1 project is obtained upon affirmative vote of the Board.

ERCOT's assessment of the Sub-Synchronous Oscillations (SSO) of existing facilities in Nueces County in the South Weather Zone, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSO impacts to the existing and planned generation resources at the time of the study. Results of the congestion analysis ERCOT conducted pursuant to Planning Guide Section 3.1.3, Project Evaluation, indicated no significant new congestion in the area with the addition of the STEC Nueces Green Ammonia Load Interconnection Project (Option 3).



The report describing the ERCOT Independent Review of the STEC Nueces Green Ammonia Load Interconnection Project (Option 3), including ERCOT staff's recommendation, is included as Attachment A.

Key Factors Influencing Issue:

1. ERCOT System improvements are needed to meet reliability planning criteria due to a proposed load addition in Nueces County in the South Weather Zone.
2. ERCOT staff found the recommended set of improvements to be the most efficient solution for meeting the planning reliability criteria, addressing thermal overloads and unsolved power flows.
3. Protocol Section 3.11.4.7 requires Board endorsement of a Tier 1 project, which is a project with an estimated capital cost of \$100 million or greater pursuant to Protocol Section 3.11.4.3(1)(a).
4. TAC voted unanimously to endorse the Tier 1 STEC Nueces Green Ammonia Load Interconnection Regional Planning Group (RPG) Project (Option 3), as recommended by ERCOT, on March 25, 2026.

Conclusion/Recommendation:

ERCOT staff recommends that the Board endorse the need for the Tier 1 STEC Nueces Green Ammonia Load Interconnection RPG Project (Option 3), which ERCOT staff has independently reviewed, and which TAC has voted unanimously to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria.



ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.

BOARD OF DIRECTORS RESOLUTION

WHEREAS, pursuant to Section 3.11.4.3(1)(a) of the Electric Reliability Council of Texas, Inc. (ERCOT) Protocols, projects with an estimated capital cost of \$100 million or greater are Tier 1 projects, for which Section 3.11.4.7 requires endorsement by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) deems it desirable and in the best interest of ERCOT to accept ERCOT staff’s recommendation to endorse the need for the Tier 1 STEC Nueces Green Ammonia Load Interconnection Regional Planning Group Project (Option 3), which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED that ERCOT is hereby authorized and approved to endorse the need for the Tier 1 STEC Nueces Green Ammonia Load Interconnection Regional Planning Group Project (Option 3), which ERCOT staff has independently reviewed, and which TAC has voted unanimously to endorse based on NERC and ERCOT reliability planning criteria.

CORPORATE SECRETARY’S CERTIFICATE

I, Brandon Gleason, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its _____ meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of _____, 2026.

Brandon Gleason
Assistant Corporate Secretary



ERCOT Independent Review of the STEC Nueces Green Ammonia Load Interconnection Project (25RPG016)

Document Revisions

Date	Version	Description	Author(s)
03/19/2026	1.0	Final	Travis Head, Scott Zuloaga
		Reviewed by	Robert Golen, Sun Wook Kang, Prabhu Gnanam

Executive Summary

South Texas Electric Cooperative (STEC) submitted the Nueces Green Ammonia Load Interconnection Project to the Electric Reliability Council of Texas' (ERCOT) Regional Planning Group (RPG) in June 2025. STEC proposed this project to facilitate the interconnection of the Nueces Green Ammonia Load in Nueces County in the South Weather Zone.

STEC's proposed project was estimated to cost \$74.0 Million and was classified as a Tier 2 project under ERCOT Protocol Section 3.11.4.3 since the proposed project would require a Certificate of Convenience and Necessity (CCN) application.

ERCOT performed an independent review and identified reliability issues (thermal overloads and voltage violations in Nueces County). ERCOT evaluated four different transmission project options.

The ERCOT Independent Review (EIR) evaluated four different transmission projects options. Based on the study results described in Section 5 and 6 of this report, ERCOT recommends the following option (Option 3) to address the reliability issues mentioned above. Option 3 consists of the following:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA, respectively, which will require a new right of way (ROW), approximately 5.9 miles;
- Construct a new Chalcedony to Nueces Load POI 345-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, which will require a new ROW, approximately 4.5 miles; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit capable structures with one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 400 MVA, approximately 2.6 miles.

This project was initially classified as a Tier 2 project under ERCOT Protocol Section 3.11.4.3(1)(b) due to the project's cost estimate being approximately \$74.0 million and requiring a CCN. However, upon completion of the EIR it was determined the project should be reclassified as a Tier 1 project under ERCOT Protocol Section 3.11.4.3(1)(d)(i) due to its estimated capital cost. The cost estimate for this Tier 1 project is approximately \$161.1 million. A CCN application will be required for the construction of the looping in of the new Nueces Load POI 345-kV substation onto the existing 345-kV transmission line from the existing Grissom substation to the existing Lon Hill substation and the new 345-kV transmission line from the planned Chalcedony substation to the new Nueces Load POI substation due to approximately 10.4 miles of new ROW. The expected in-service date (ISD) of this project is May 2031.

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Appendix20

1 Introduction

In June 2025, South Texas Electric Cooperative (STEC) submitted the Nueces Green Ammonia Load Interconnection Project to the Electric Reliability Council of Texas' (ERCOT) Regional Planning Group (RPG) to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria thermal overloads and voltage violations in Nueces County due to a new large load confirmed by TSP Attestation Letter (1,150 MW in 2028). The proposed project is located in the South Weather Zone in Nueces County.

STEC's proposed project was classified as Tier 2 project pursuant to ERCOT Nodal Protocol Section 3.11.4.3, with an estimated cost of \$74.0 million. A Certificate of Convenience and Necessity (CCN) application would be required for the looping in of the new Nueces Load POI 345-kV substation onto the existing 345-kV transmission line from the existing Grissom substation to the existing Lon Hill substation and the new 345-kV transmission line from the planned Chalcedony substation to the new Nueces Load POI substation due to approximately 10.4 miles of new right of way (ROW). The expected in-service date (ISD) for this project is June 2027.

ERCOT conducted an independent review for this RPG project to identify any reliability needs in the area and evaluated various transmission upgrade options. This report describes the study assumptions, methodology, and the results of ERCOT Independent Review (EIR) of the project.

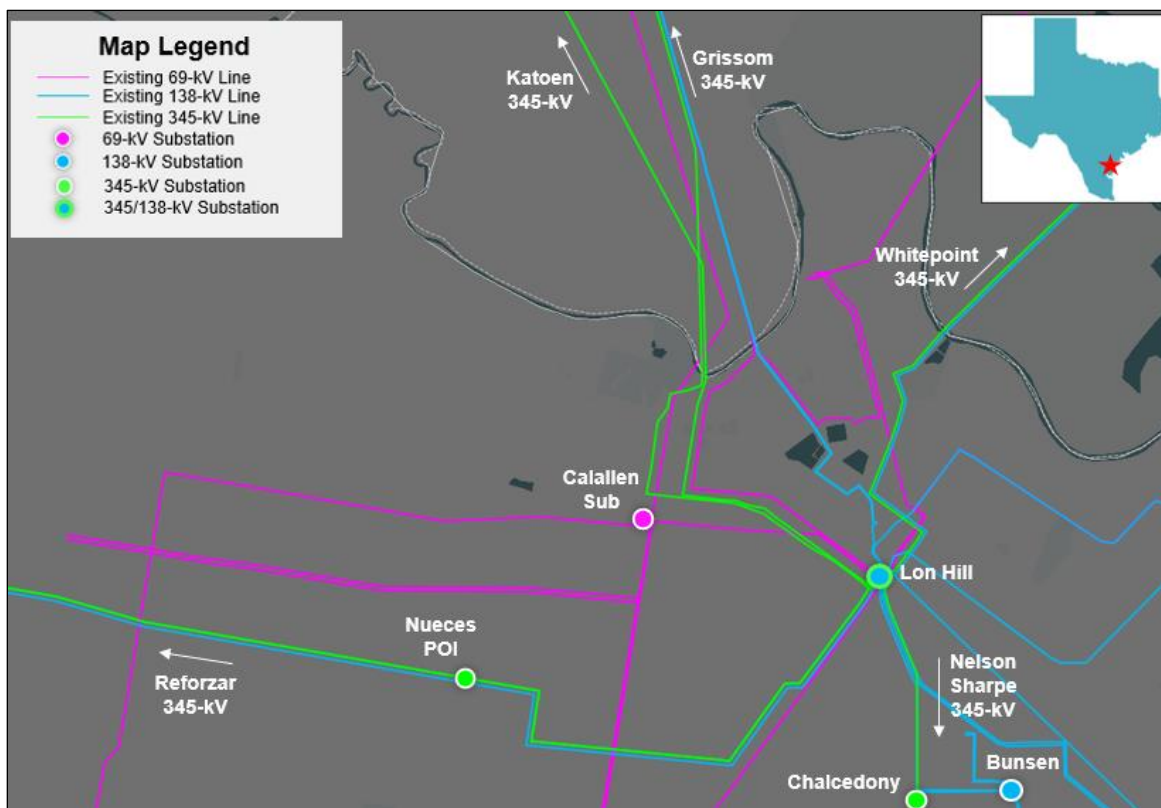


Figure 1.1: Map of Transmission System in Study Area

2 Study Assumptions and Methodology

ERCOT performed studies under various system conditions to identify any reliability issue and to determine transmission upgrades to support the proposed Nueces Green Ammonia Load Interconnection Project, if an upgrade is deemed necessary. This section describes the study assumptions and criteria used to conduct the independent study.

2.1 Study Assumptions for Reliability Analysis

This project is in the South Weather Zone in Nueces County.

2.1.1 Steady-State Study Base Case

The Final 2024 Regional Transmission Plan (RTP) cases, published on the Market Information System (MIS) on December 22, 2024, were used as reference cases in this study. The 2029 Summer Peak Load case was selected for the long-term outlook. The steady-state study base case was constructed by updating transmission, generation, and load data of the 2029 Summer Peak Load case noted below:

- Case: 2024RTP_2029_SUM_12222024¹.

2.1.2 Transmission Topology

Transmission projects within the study area with ISDs by June 2028 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)² report posted in November 2025 was used as a reference to identify the applicable projects added to the study base case as listed in Table 2.1.

Table 2.1: List of Transmission Projects Added to the Study Base Case

TPIT/RPG No	Project Name	Tier	Project ISD	TSP	County
91537	Starlite_Substation_Addition	4	12/01/25	LCRATSC	Nueces
24RPG035	Aransas Pass to Rincon 69-kV Line Rebuild Project	2	1/01/2027	AEP TCC	San Patricio
93242	Saxet Substation Upgrade	4	6/01/2027	LCRATSC	Nueces
81686	Chalcedony: Construct New 345 kV Station	4	3/01/2028	AEP TCC	Nueces

Transmission projects, listed in Table 2.2, identified in the 2024 RTP as placeholder project in the study area and were not approved by RPG were removed from the study base case.

Table 2.2: List of Transmission Projects Removed from the Study Base Case

RTP Project Index	Project Name	County
2024-S1	Dupont Area 138-kV Line Upgrades	San Patricio, Nueces
2024-S3	San Diego Sub (5654) to Orange Groves Switch (5658) 69-kV Line Upgrade	Duval, Jim Wells

¹ 2024 Regional Transmission Plan Postings: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

² TPIT Report: <https://www.ercot.com/gridinfo/planning>

RTP Project Index	Project Name	County
2024-S6	Seabird (84250) 138-kV Cap Bank Addition	San Patricio
2024-S8	Lon Hill Area 345-kV Upgrades	Nueces, San Patricio, Bee
2024-S11	Caravel (85010) 138-kV Cap Bank Additions	Kleberg
2024-S12	Lon Hill (8452) to Bunsen (8459) 138-kV Line Upgrade	Nueces
2024-S13	Nelson Sharpe 345/138-kV Transformer Addition	Nueces
2024-S14	Naismith 345/138-kV Transformer Addition	San Patricio

2.1.3 Generation

Based on the June 2025 Generator Interconnection Status (GIS)³ report posted on the ERCOT website in July 2025, generators in the study area that met Planning Guide Section 6.9(1) conditions with commercial operations date (COD) prior to June 2028 were added to the study base case. These generation additions are listed in Table 2.3. All new generation dispatches were consistent with the 2024 RTP methodology.

Table 2.3: List of Generation Added to the Study Base Case Based on the June 2025 GIS Report

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
21INR0359	Hickerson Solar	SOL	11/21/2025	311.1	Bosque
22INR0239	Rockefeller Storage	BESS	06/01/2027	206.8	Schleicher
22INR0437	TORMES SOLAR	SOL	03/31/2027	382.1	Navarro
22INR0457	Anson BAT	BESS	08/01/2026	150.6	Jones
22INR0605	Camino Santiago Solar	SOL	02/18/2027	196.3	Milam
23INR0078	Shaw Solar	SOL	04/29/2026	124.7	Bandera
23INR0181	Starling Storage	BESS	05/15/2027	63.6	Gonzales
23INR0225	MRG GOODY SOLAR	SOL	05/02/2026	170.8	Lamar
23INR0538	Roadrunner Crossing BESS SLF	BESS	12/31/2025	150.4	Eastland
24INR0181	Bynum Solar Project	SOL	12/01/2025	56.0	Coryell
24INR0188	Tehuacana Creek Solar SLF	SOL	03/10/2027	505.5	Navarro
24INR0189	Tehuacana Creek BESS SLF	BESS	03/10/2027	419.0	Navarro
24INR0305	MRG Goody Storage	BESS	05/02/2026	52.3	Lamar
24INR0355	Anatole Renewable Energy Storage	BESS	03/31/2027	207.8	Henderson
24INR0364	Pitts Dudik II	SOL	02/04/2026	30.2	Hill
24INR0386	Black & Gold Energy Storage	BESS	06/30/2027	254.6	Menard
24INR0453	Longfellow BESS I	BESS	01/31/2026	55.0	Pecos
24INR0455	Longfellow BESS II	BESS	01/31/2026	105.8	Pecos
24INR0493	Crowned Heron BESS 2	BESS	03/31/2026	154.2	Fort Bend
24INR0528	Blanquilla BESS	BESS	05/15/2026	200.8	Nueces
24INR0533	Padua Grid BESS Unit 2	BESS	03/15/2026	150.9	Bexar
24INR0584	Houston IV BESS	BESS	06/03/2026	164.6	Harris

³ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
25INR0018	Yellow Cat Wind	WIN	04/01/2027	262.0	Navarro
25INR0199	Bonham Solar 1	SOL	08/31/2026	138.4	Limestone
25INR0229	OCI Cobb Creek Solar	SOL	12/01/2026	203.1	Hill
25INR0233	OCI Cobb Creek ESS	BESS	12/01/2026	201.6	Hill
25INR0391	Purple Sage BESS 1	BESS	05/30/2027	156.0	Collin
25INR0392	Purple Sage BESS 2	BESS	05/30/2027	156.0	Collin
26INR0034	Bracero Pecan Storage	BESS	04/01/2027	232.0	Reeves
26INR0296	Sherbino II BESS SLF	BESS	02/08/2026	77.4	Pecos
26INR0543	Three Canes Solar SLF	SOL	03/10/2027	333.0	Navarro
28INR0024	Padua Grid BESS Unit 3	BESS	05/15/2026	201.4	Bexar

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study were reviewed. The units listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status.

Table 2.4: List of Generation Opened to Reflect Mothballed/Retired/Forced Outage Status

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
110205	BYU_BYU_G8	4.0	Coast
110124	DOWGEN_DOW_G66	95.6	Coast
151361	CHISMGRD_G1	20.3	North Central

Generation listed in Table 2.5 were closed (turned on) in the study base case to reflect the change in their Generation Resource as these resources are returning to year-round service.

Table 2.5: List of Generation Closed to Reflect Returning to Service Status

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
110020	WAP_GT2	71.0	Coast
150023	MCSES_UNIT8	568.0	North Central

2.1.4 Loads

Loads in the ERCOT system were consistent with 2024 RTP. This project is driven by the new large load confirmed by TSP Attestation Letter from STEC, shown in Table 2.6. This load was added to the study base case. No load adjustments outside the South Weather Zone were needed to maintain the minimum reserve requirements consistent with the 2024 RTP methodology.

Table 2.6: Newly Confirmed Load

Year	Capacity (MW)
2028	1,150

2.2 Long-Term Load-Serving Capability Assessment

ERCOT performed a long-term load-serving capability assessment to compare the performance of the study options.

Incremental load serving capability was evaluated to assess the long-term load-serving capability. Load in the study area was increased (customer designated as non-scalable remained at the same level as in the study base case), and conforming loads outside of Nueces County were decreased to balance power.

2.3 Maintenance Outage Scenario

ERCOT performed a maintenance outage evaluation based on historic off-peak system load. Conforming loads in the South Weather Zone were scaled down to 89.2% of the summer peak load to create the off-peak case. Loads designated as non-scalable remained at the same level as in the study base case. Next, ERCOT Planning Guide Section 4.1.1.8 Maintenance Outage Reliability Criteria was evaluated to identify and address violations.

2.4 Study Assumptions for Dynamic Stability Analysis

ERCOT conducted a limited dynamic stability study utilizing the 2029 case in Section 2.1.1, incorporating the transmission system upgrades identified in the steady-state analysis. In alignment with the generation shown in Table 2.3 in Section 2.1.3, available dynamic data for generation beyond the units already included in the 2028 Summer Peak Dynamic Working Group (DWG) flat start case was utilized.

ERCOT undertook the following significant efforts to develop the study case:

- Updated dynamic data for additional generation units incorporated into the steady-state case;
- Updated the collector systems for these new units;
- Included existing dynamic load models, under-frequency load shed, and under-voltage load shed protection models provided by relevant TSPs; and
- Made necessary updates during the flat stat case development, by comparing the DWG case with the case utilized in this study.

2.5 Study Assumptions for Congestion Analysis

Congestion analysis was conducted to identify any new congestion in the study area with the addition of the recommended transmission upgrade option.

The 2024 RTP 2029 economic case was updated based on the June 2025 GIS⁴ report for generation updates and the October 2025 TPIT⁵ report for transmission updates to conduct congestion analysis. The 2029 study year was selected as it is the future year case currently available.

⁴ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

⁵ TPIT Report: <https://www.ercot.com/gridinfo/planning>

New transmission project additions are listed in Table A.1 in the Appendix A.1 of this document.

New generation additions listed in Table A.2 in Appendix A.1 of this document were added to the economic base case and all generation listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status. Furthermore, generation listed in Table 2.5 were removed from seasonal settings in the study base case as these resources are returned to year-round service.

The new large load confirmed by TSP Attestation Letter from STEC (full load of 1,150 MW) listed in Table 2.6 was added to the economic study cases.

2.6 Methodology

This section lists the Contingencies and Criteria used for project review along with tool used to perform the various analyses.

2.6.1 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols, and ERCOT Planning Guide⁶.

Contingencies⁷ were updated based on the changes made to the topology as described in Section 2.1 of this document. The following steady-state contingencies were simulated for the study region:

- P0 (System Intact);
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (345-kV only);
- P3: G-1+N-1 (G-1: generation outage) {Papalote Creek Wind II, El Algodon Alto W U1, and Cranell Wind}; and
- P6-2: X-1+N-1 (X-1: 345/138-kV transformers only) {Lon Hill, Whitepoint, and Pawnee}.

All 60-kV and above buses, transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

- Thermal
 - Rate A (normal rating) for pre-contingency conditions; and
 - Rate B (emergency rating) for post-contingency conditions.
- Voltages
 - Voltages exceeding pre-contingency and post-contingency limits; and
 - Voltage deviations exceeding 8% on non-radial load buses.

⁶ ERCOT Planning: <http://www.ercot.com/mktrules/guides/planning/current>.

⁷ Details of each event and contingency category is defined in the NERC Reliability Standard TPL-001-5.1.

For the limited dynamic stability analysis of Option 3, the study evaluated critical 138-kV and 345-kV P1, P6, and P7 contingencies in the study area. The critical contingencies were selected based on engineering judgement and critical contingencies identified in the steady-state analysis.

Monitored quantities included all 138-kV and 345-kV bus voltages and frequencies in the study area as well as active and reactive power for at least one unit in all generation projects in the study area.

For dynamic stability analysis, the following criteria were enforced:

- For planning event P1: No generating unit shall pull out of synchronism. A generator being disconnected from the system by fault clearing action or by a Remedial Action Scheme (RAS) is not considered pulling out of synchronism;
- For planning events P6 and P7: When a generator pulls out of synchronism in the simulations, the resulting apparent impedance swings shall not result in the tripping of any transmission system elements other than the generating unit and its directly connected facilities;
- For any operating condition in category P1 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, voltage shall recover to 0.90 p.u. within five seconds after clearing the fault; and
- For any operating condition in category P6 and P7 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, voltage shall recover to 0.90 p.u. within ten seconds after clearing the fault.

For any operating condition in categories P1, P6, and P7 of the NERC Reliability Standard addressing Transmission System Planning Performance Requirements, power oscillation within the range of 0.2 Hz to 2 Hz decays with a minimum 3% damping ratio.

2.6.2 Study Tool

ERCOT utilized the following software tools to perform this independent study:

- PowerWorld Simulator version 24 for Security Constrained Optimal Power Flow and steady-state contingency analysis;
- Siemens PTI PSS/E (v.35.6): to perform time domain dynamic simulation of the electric network response to major disturbances; and
- UPLAN version 12.3.0.30786 to perform congestion analysis.

3 Project Need

A steady-state reliability analysis was performed in accordance with NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Criteria described in Section 2.6 of this document. This analysis indicated thermal overloads and unsolved power flows in Nueces County under NERC P1(N-1), P7(N-1), P3(G-1+N-1), and P6-2(X-1+N-1) conditions. These issues are summarized in Table 3.1 and visually illustrated in Figure 3.1. Detailed thermal overloads are listed in Table 3.2.

Table 3.1: Violations Observed Under NERC Reliability Standard TPL-001-5.1 and ERCOT Planning Criteria in the Study Area

NERC Contingency Category	Voltage Violations	Thermal Overloads	Unsolved Power Flow
P0: N-0	None	None	None
P1, P2-1, P7: N-1	None	2 ⁸	2 ⁸
P3: G-1+N-1	None	1 ⁸	2 ⁸
P6-2: X-1+N-1	None	1 ⁸	2 ⁸

Table 3.2: Thermal Overloads Observed in the Study Area

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P1: N-1	Lon Hill to Calallen Sub	69	2.1	100.2
P1: N-1	Lon Hill to Bunsen	138	2.6	107.9

The two (2) unsolved power flows were observed under NERC P1(N-1), P7(N-1), P3(G-1+N-1), and P6-2(X-1+N-1) conditions:

- (REDACTED)
- (REDACTED)

⁸ Violations seen in the basecase under P1 and P7 events were also seen under G-1+N-1 and/or X-1+N-1 events.

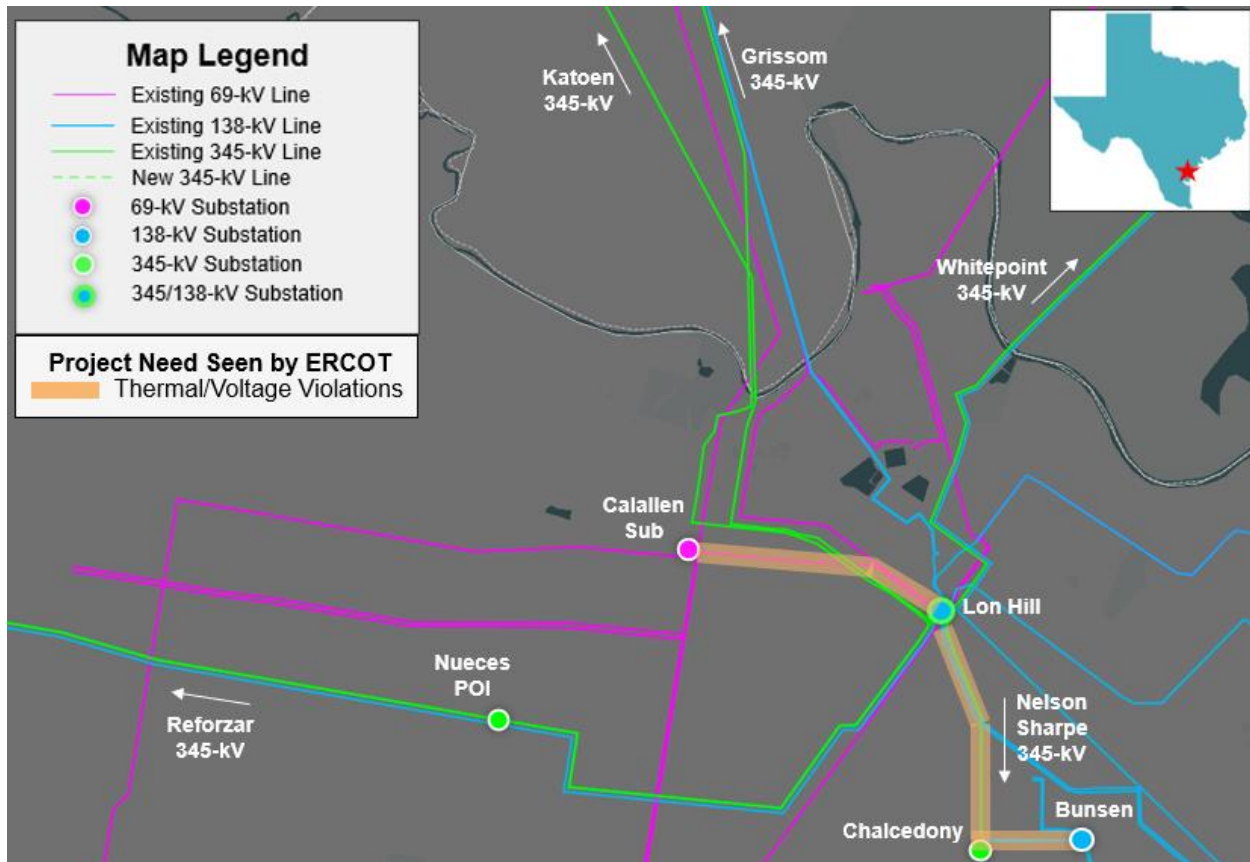


Figure 3.1: Study Area Map Showing Project Need Seen by ERCOT

4 Description of Project Options

ERCOT evaluated four system improvement options to address reliability violations observed in the study base case in the study area.

Option 1 (STEC Proposed Solution) consists of the following:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line; and
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA, respectively, which will require a new right of way (ROW), approximately 5.9 miles.

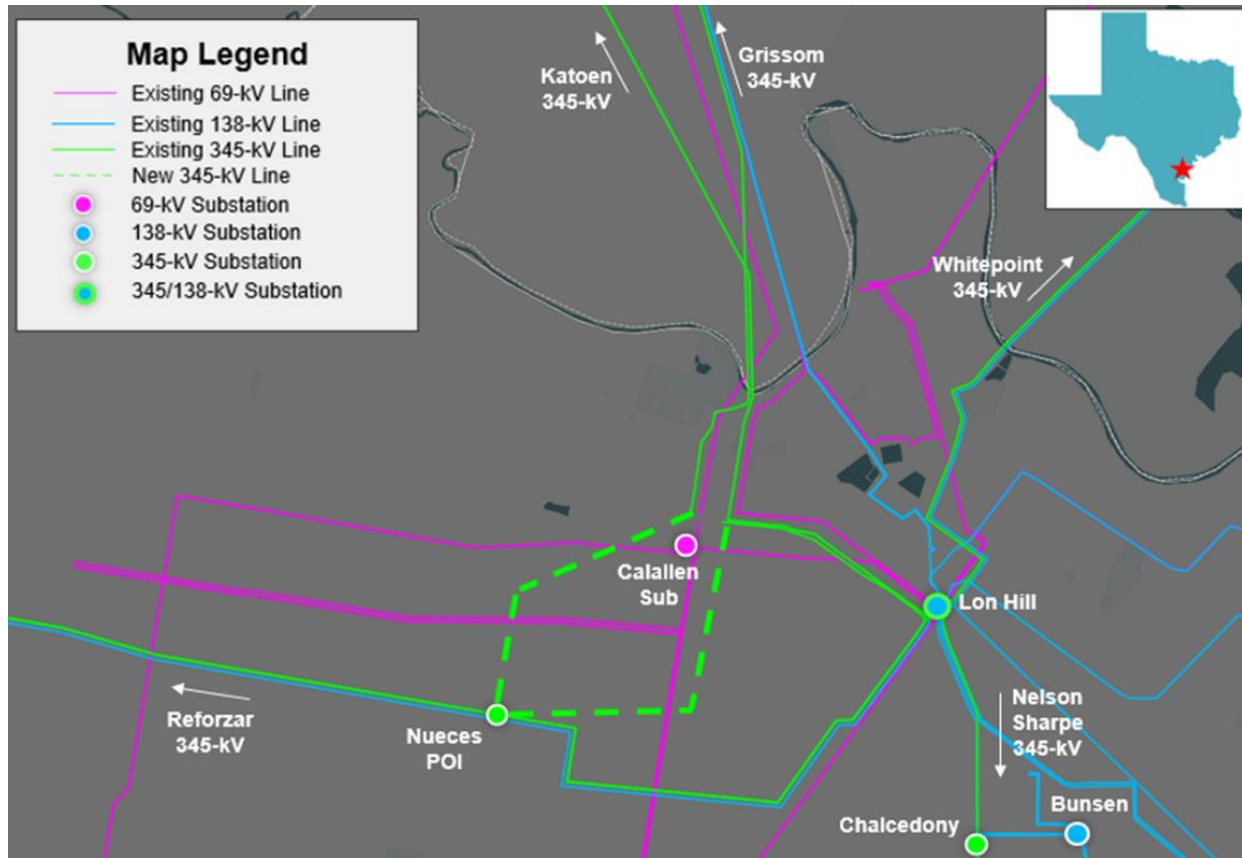


Figure 4.1: Map of Option 1

Option 1A consists of the following:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA, respectively, which will require a new ROW, approximately 5.9 miles; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit capable structures with one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 400 MVA, approximately 2.6 miles.

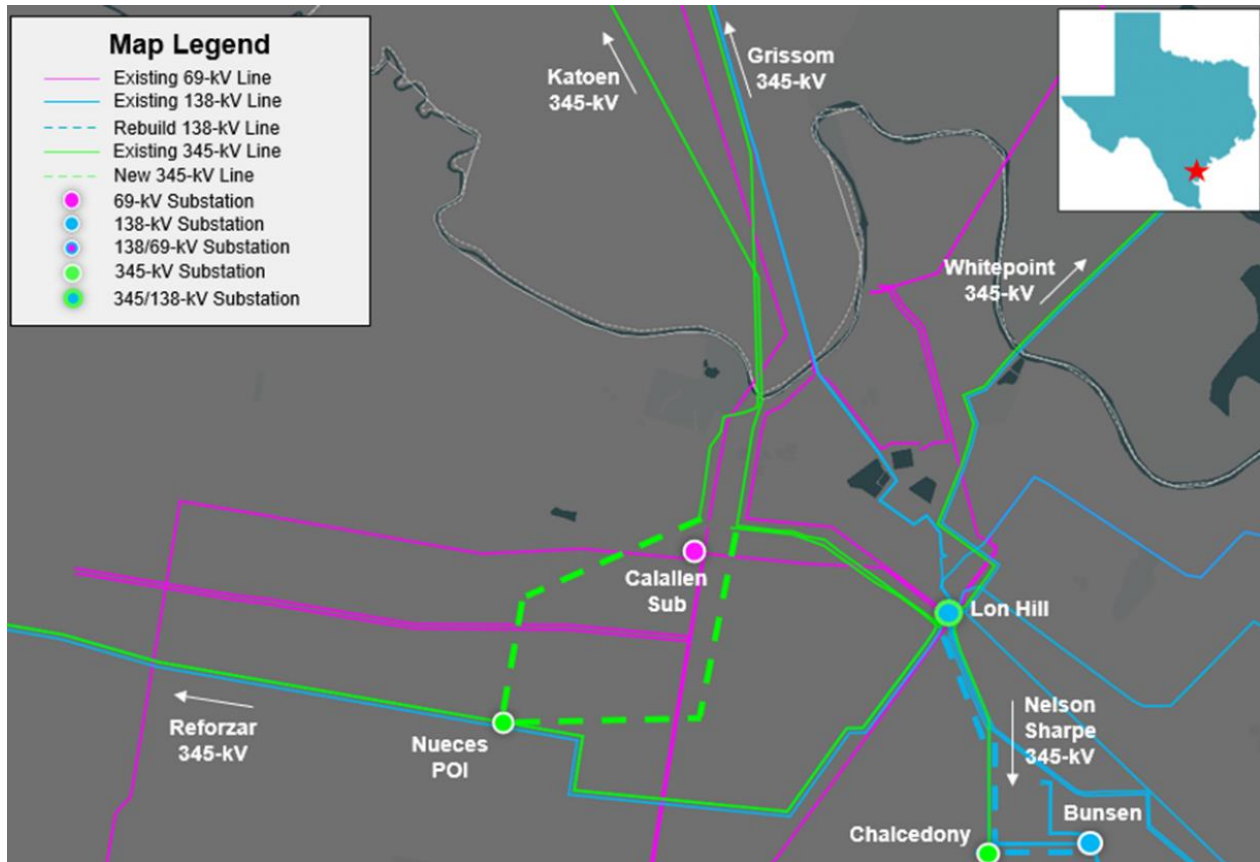


Figure 4.2: Map of Option 1A

Option 2 consists of the following:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Construct a new Grissom to Chalcedony 345-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, which will require a new ROW, approximately 33.46 miles;
- Construct a new Katoen to Nueces POI 345-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, which will require a new ROW, approximately 16.1 miles; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit capable structures with one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 400 MVA, approximately 2.6 miles.

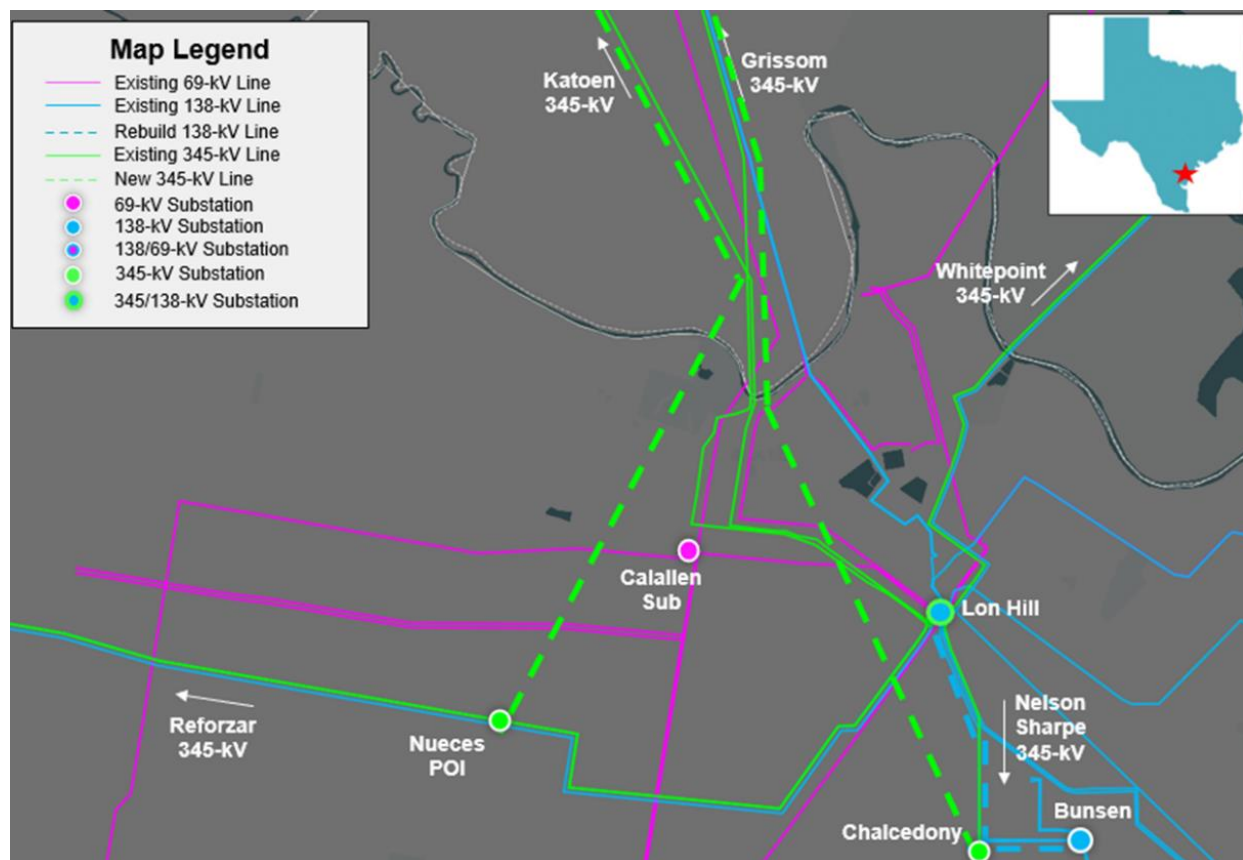


Figure 4.3: Map of Option 2

Option 3 consists of the following:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA, respectively, which will require a new ROW, approximately 5.9 miles;
- Construct a new Chalcedony to Nueces Load POI 345-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, which will require a new ROW, approximately 4.5 miles; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit capable structures with one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 400 MVA, approximately 2.6 miles.

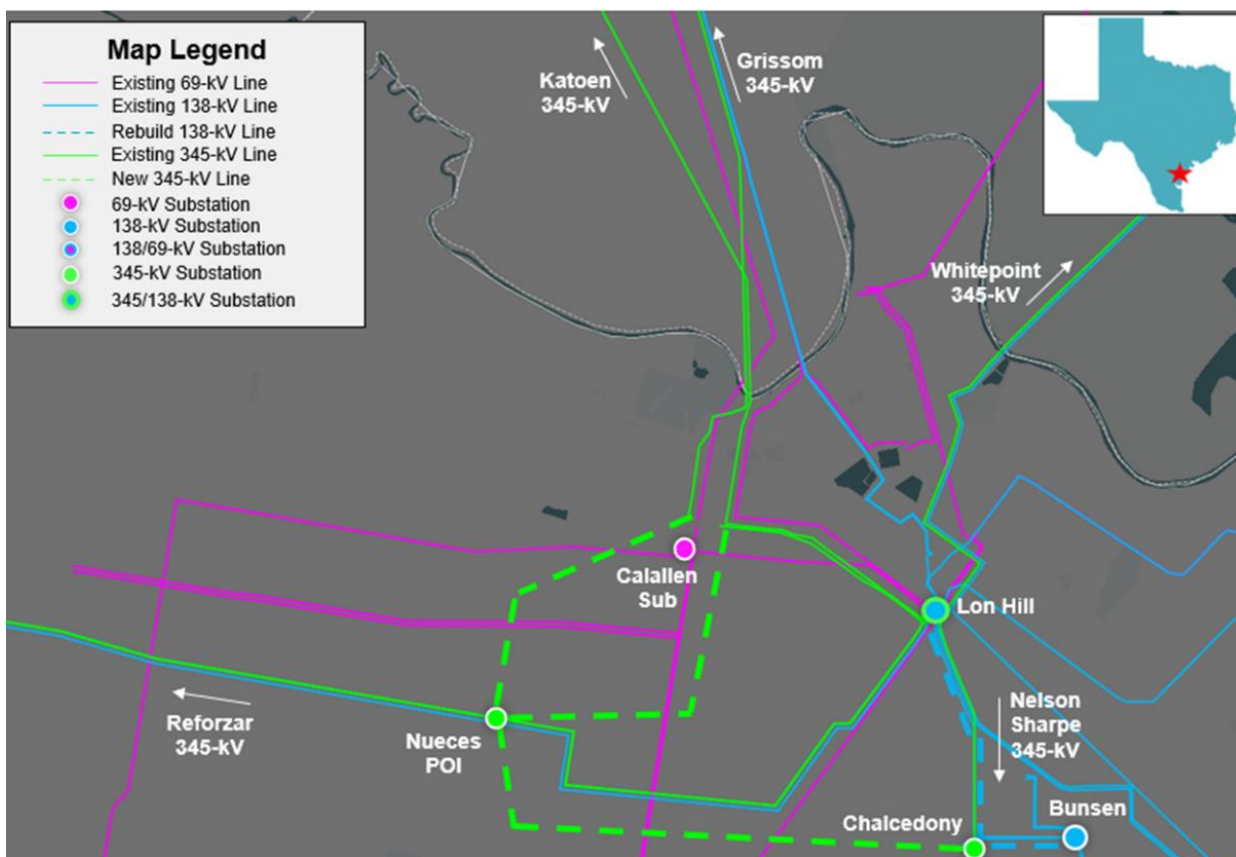


Figure 4.4: Map of Option 3

5 Option Evaluations

ERCOT performed a reliability analysis, maintenance outage evaluation, and long-term load-serving capability analysis to evaluate all options and to identify any reliability impact of the options in the study area. Based on the results of these analyses, short-listed options were selected for further comparison. This section details these studies and their results and compares the options.

5.1 Results of Reliability Analysis

All four options were evaluated based on the contingencies described in section 2.6 of this report. No reliability criteria violations were identified for Option 1, Option 1A, Option 2, and Option 3 as shown in Table 5.1.

Table 5.1: Results of the Reliability Assessment of All Four Options

Option	Unsolved Power Flow	N-1		X-1 + N-1		G-1 + N-1	
		Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation
1	None	None	None	None	None	None	None
1A	None	None	None	None	None	None	None
2	None	None	None	None	None	None	None

Option	Unsolved Power Flow	N-1		X-1 + N-1		G-1 + N-1	
		Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation
3	None	None	None	None	None	None	None

5.2 Maintenance Outage Evaluation

Using the P1, P2.1, and P7 contingencies based on the review of the system topology of the area, ERCOT conducted an N-2 contingency analysis for each option to represent system element outage(s) under maintenance outage conditions (N-1-1) in the area. Then, each N-2 violation was run as an N-1-1 contingency scenario, with system adjustments between the contingencies. The transmission elements in the study area were monitored in the maintenance outage evaluation.

As shown in Table 5.2, the results of this maintenance outage assessment indicate Option 2 and Option 3 did not result in any reliability violations while Option 1 and Option 1A observed reliability violations.

Table 5.2: Results of Maintenance Outage Evaluation for All Four Options

Option	Voltage Violations	Thermal Overloads	Unsolved Power Flow
1	1	1	1
1A	1	None	1
2	None	None	None
3	None	None	None

5.3 Long-Term Load-Serving Capability Analysis

ERCOT conducted long-term load-serving capability assessments of the four options to compare the relative performance.

The results show that all four options provided additional long-term load-serving capability with Option 3 providing the greatest and Option 1 providing the least. These results are shown in Table 5.3

Table 5.3: Results of Long-Term Load-Serving Capability Assessment of All Four Options

Option	Incremental Load Serving Capability (~MW)
1	6.4
1A	66.4
2	21.8
3	633.4

5.4 Cost Estimate and Feasibility Assessment

TSPs performed feasibility assessments and provided cost estimates for all four options. Table 5.4 summarizes the cost estimate, estimated mileage of CCN required, option feasibility, and expected year of complication for all four options.

Table 5.4: Cost Estimates and Feasibility for All Four Options

Option	Cost Estimates (~\$M)	CCN Required (~miles)	Feasible	Expected ISD (Year)
1	111.5	Yes (5.9)	Yes	2031
1A	123.4	Yes (5.9)	Yes	2031
2	379.5	Yes (49.6)	Yes	2032
3	161.1	Yes (10.4)	Yes	2031

The cost estimate for the STEC Proposed Option 1 increased from the originally submitted \$74.0 million to \$111.5 million due to the initial cost estimates not including AEP’s increased capability requirement for the 345-kV transmission rebuild, the addition of AEP’s portion of the new Nueces Load POI substation, and the increased cost associated with recent tariff changes.

5.5 Short-Listed Options

Based on the results shown in Section 5.2, Option 2 and Option 3 were selected as short-listed options for further comparison. These two options are illustrated in Figures 5.1, and 5.2.

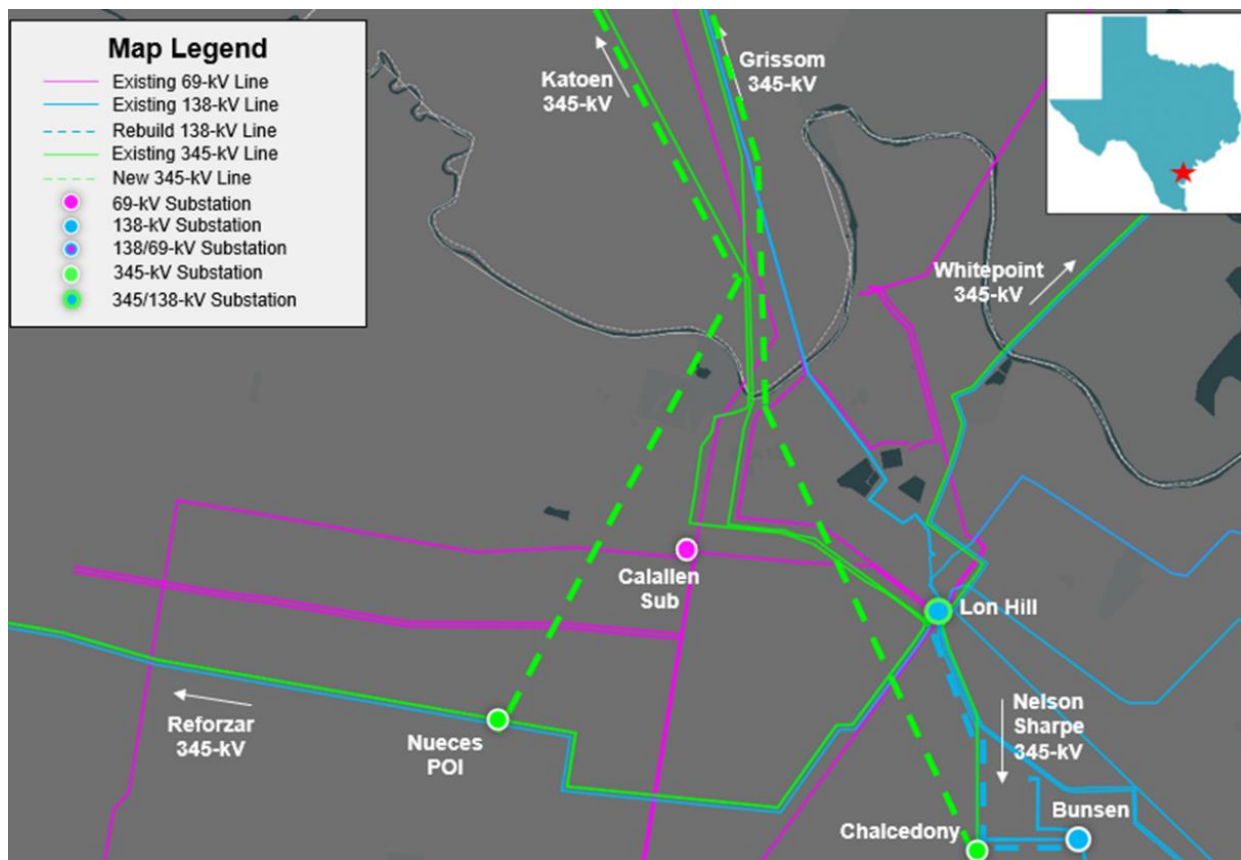


Figure 5.1: Map of Option 2

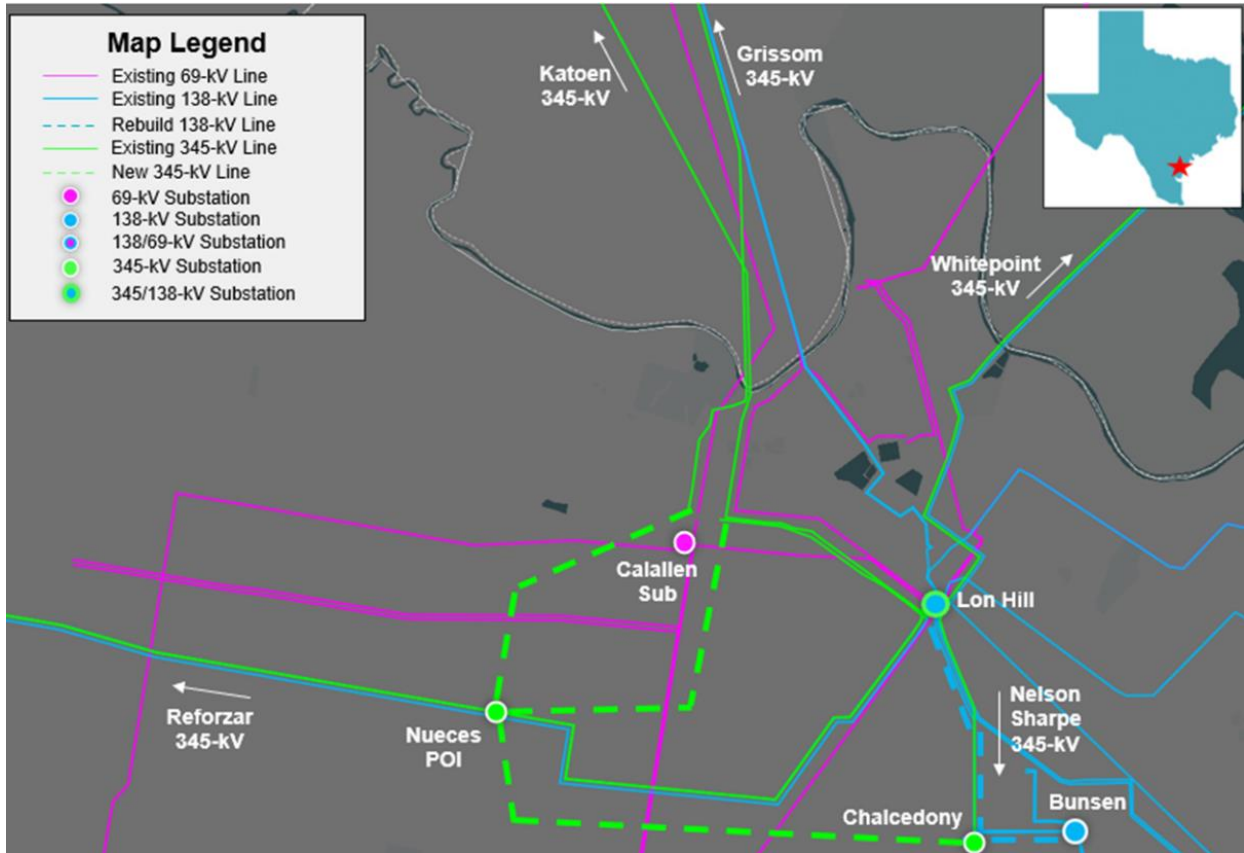


Figure 5.2: Map of Option 3

6 Comparison of Short-Listed Options

Based on the results from Option Evaluations in Section 5, the two short-listed options are summarized in Table 6.1.

Table 6.1: Comparison of the Two Short-Listed Options

	Option 2	Option 3
Met ERCOT and NERC Reliability Criteria	Yes	Yes
Improves Long-Term Load-Serving Capability (~MW)	21.8	633.4
CCN Required (~miles)	Yes (49.6)	Yes (10.4)
Construction Feasibility (Based on TSP assessment)	Yes	Yes
Capital Cost Estimates ⁹ (~\$M)	379.5	161.1
Estimated ISD (Year)	2032	2031

ERCOT recommends Option 3 as the preferred option to address the reliability need in the study area based on the following considerations:

- Option 3 addresses the project need in the study area and meets ERCOT and NERC Reliability Criteria;

⁹ The cost estimates were provided by the TSPs.

- Option 3 is the least cost option;
- Option 3 improves long-term load-serving capability;
- Option 3 requires the least amount of CCN mileage of the short-listed options; and
- Option 3 has the earliest estimated ISD of the short-listed options.

7 Additional Analysis and Assessment

The preferred option (Option 3, with a cost estimate of approximately \$161.1 million) is categorized as a Tier 1 project under ERCOT Protocol 3.11.4.3(1)(a). ERCOT performed generation and load sensitivity studies to identify the preferred option performance, as required under Planning Guide Section 3.1.3(4). Additionally, a Sub-synchronous Oscillations (SSO) Assessment was performed.

7.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a).

Based on a review of the December 2025 GIS¹⁰ report, one (1) unit was found within the study area that could have an impact on the identified reliability issues. This unit, listed in Table 7.1, was added to the recommended option case following 2024 RTP Methodology. ERCOT determined that the addition of this generator did not impact the recommended option.

Table 7.1: List of Unit that Could have an Impact on the Identified Reliability Issues

GINR	Unit Name	Fuel Type	Max Capacity (~MW)	County
25INR0375	NavBoot BESS	OTH	303.7	Nueces

7.2 Load Scaling Sensitivity Analysis

Planning Guide Section 3.1.3(4)(b) requires an evaluation of the potential impact of load scaling on the criteria violations seen in the 2024 RTP study. Before 2024, ERCOT's RTP adopted the methodology of developing four sets of summer peak cases with each case representing one study region for each study year. For each summer peak case, the loads outside of the study region may be scaled down from the respective non-coincident summer peak levels to maintain a certain reserve requirement. This methodology may cause potential impact of load scaling on the criteria violations. Starting 2024, ERCOT's RTP adopted a new methodology of having one summer peak case for each study year with non-coincident peaks for each of the Weather Zones, which would eliminate the load scaling impact. As such, load scaling sensitivity analysis is no longer needed.

¹⁰ GIS Report: <https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER>

7.3 Sub-synchronous Oscillations (SSO) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted an SSO screening for the recommended option (Option 3) and found no adverse SSO impacts to the existing and planned generation resources in the study area.

7.4 Dynamic Stability Analysis

Dynamic stability analysis examines a power system's behavior before, during, and after a disturbance such as a fault on a transmission line. It involves assessing the system's ability to maintain stability, withstand the disturbance, and return to a steady-state condition. The analysis ensures that the system can handle faults without losing synchronism or experiencing unacceptable oscillations, ensuring reliable and continuous operation.

As detailed in Section 2.6.1, ERCOT performed a limited dynamic stability analysis focused exclusively on the P1, P6, and P7 contingencies in the study area. The limited dynamic stability analysis was performed for the recommended option (Option 3).

The results demonstrated that there were no planning criteria violations pertaining to transient stability as specified in the criteria described in Section 2.6.1. Example plots demonstrating that performance criteria are met can be found in Appendix A.2.

7.5 Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the recommended project, Option 3, using the 2024 RTP 2029 economic study case.

The results of congestion analysis indicated no additional congestion in the area due to the addition of the recommended transmission upgrades of Option 3.

8 Conclusion

ERCOT evaluated four transmission upgrade options to resolve the thermal overloads and unsolved power flows identified in the study area. Based on the results of the independent review, ERCOT recommends Option 3 as the preferred solution because it addresses all project needs, meets ERCOT and NERC Reliability Criteria, is the least cost option, improves long-term load-serving capability, requires the least amount of CCN miles, and has the earliest estimated ISD.

Option 3 consists of the following upgrades:

- Construct a new Nueces Load POI 345-kV substation cutting in on the existing Reforzar to Lon Hill 345-kV transmission line;
- Loop in the new Nueces Load POI onto the existing Lon Hill to Grissom 345-kV transmission line using single-circuit structures, with normal and emergency ratings of at least 1059 MVA and 1195 MVA, respectively, which will require a new ROW, approximately 5.9 miles;

- Construct a new Chalcedony to Nueces Load POI 345-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of at least 2000 MVA, which will require a new ROW, approximately 4.5 miles; and
- Rebuild the existing Lon Hill to Bunsen 138-kV transmission line on double-circuit capable structures with one circuit in place where not sharing a common tower, with normal and emergency ratings of at least 400 MVA, approximately 2.6 miles.

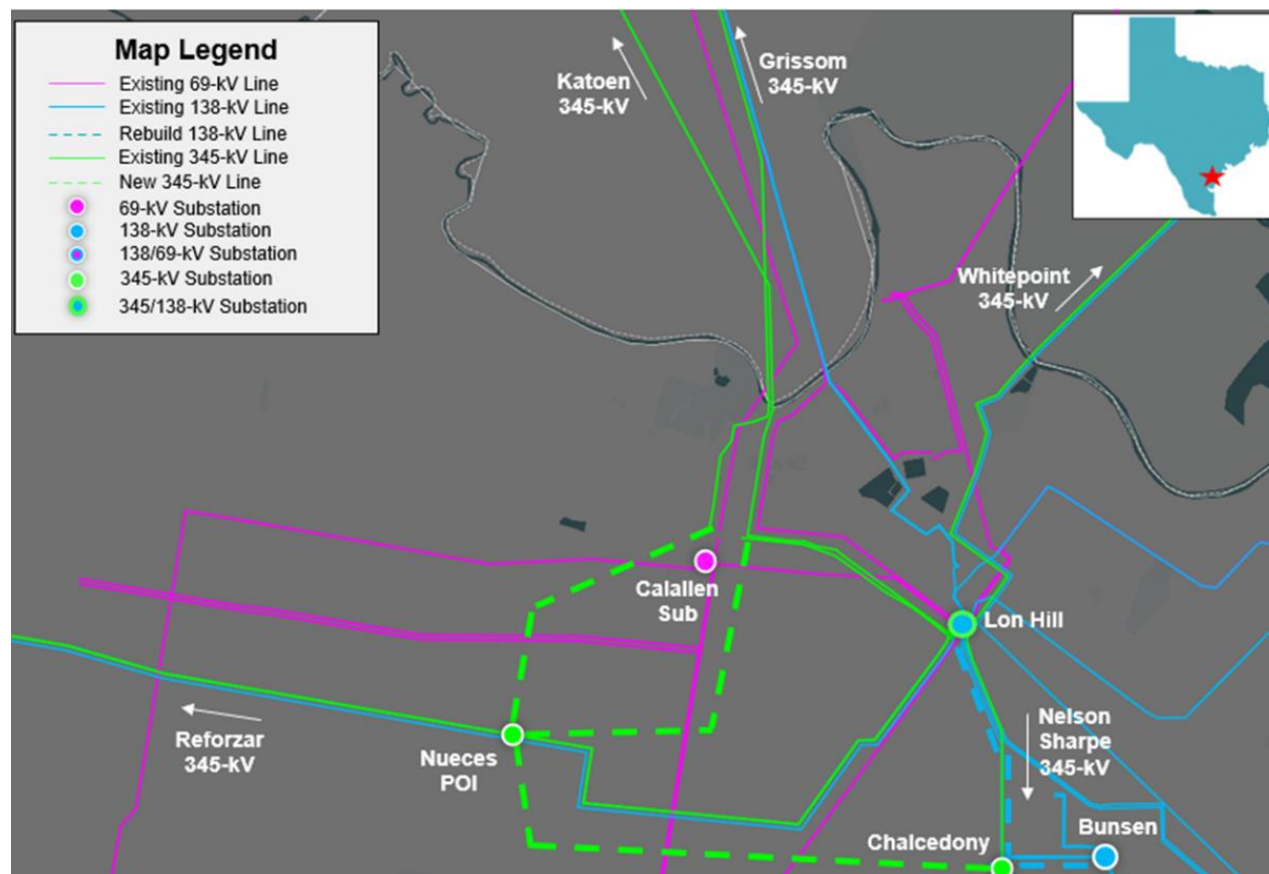


Figure 8.1: Map of Option 3

This project was initially classified as a Tier 2 project under ERCOT Protocol Section 3.11.4.3(1)(b) due to the project's cost estimate being approximately \$74.0 million and requiring a CCN. However, upon completion of the EIR it was determined the project should be reclassified as a Tier 1 project under ERCOT Protocol Section 3.11.4.3(1)(d)(i) due to its estimated capital cost. The cost estimate for this Tier 1 project is approximately \$161.1 million. A CCN application will be required for the construction of the looping in of the new Nueces Load POI 345-kV substation onto the existing 345-kV transmission line from the existing Grissom substation to the existing Lon Hill substation and the new 345-kV transmission line from the planned Chalcedony substation to the new Nueces Load POI substation due to approximately 10.4 miles of new ROW. The expected ISD of this project is May 2031.

Appendix

Appendix A.1:

Table A.1: List of Transmission Project added to the Economic Base Case


TPIT No	Project Name	Tier	Project ISD	County
81686	Chalcedony: Construct New 345 kV Station	4	Mar-28	Nueces

Table A.2: List of Generation Added to the Economic Base Case Based on June 2025 GIS Report

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
21INR0359	Hickerson Solar	SOL	12/31/2025	311.1	Bosque
22INR0239	Rockefeller Storage	BAT	06/01/2027	206.8	Schleicher
22INR0437	TORMES SOLAR	SOL	03/31/2027	382.1	Navarro
22INR0457	Anson BAT	BAT	12/01/2027	150.6	Jones
22INR0466	Pajarita BESS	BAT	07/19/2028	205.5	Cameron
22INR0605	Camino Santiago Solar	SOL	02/18/2027	196.3	Milam
23INR0078	Shaw Solar	SOL	04/29/2026	124.7	Bandera
23INR0181	Starling Storage	BAT	05/15/2027	63.6	Gonzales
23INR0200	Paradiso BESS	BAT	03/15/2028	100.9	Atascosa
23INR0225	MRG GOODY SOLAR	SOL	03/20/2026	170.8	Lamar
23INR0342	Brizo BESS	BAT	12/01/2027	140.8	Victoria
23INR0538	Roadrunner Crossing BESS SLF	BAT	02/13/2026	150.4	Eastland
24INR0065	Keys Hollow Solar Phase II SLF	SOL	03/10/2028	204.1	Goliad
24INR0067	KEYS HOLLOW SOLAR SLF	SOL	03/10/2028	204.1	Goliad
24INR0156	Moonstone Solar Project	SOL	03/31/2029	145.8	Wilson
24INR0181	Bynum Solar Project	SOL	05/01/2026	56.0	Coryell
24INR0188	Tehuacana Creek Solar SLF	SOL	03/10/2027	505.5	Navarro
24INR0189	Tehuacana Creek BESS SLF	BAT	03/10/2027	419.0	Navarro
24INR0305	MRG Goody Storage	BAT	03/20/2026	52.3	Lamar
24INR0355	Anatole Renewable Energy Storage	BAT	03/31/2027	207.8	Henderson
24INR0364	Pitts Dudik II	SOL	04/24/2026	30.2	Hill
24INR0386	Black & Gold Energy Storage	BAT	07/30/2027	254.6	Menard
24INR0453	Longfellow BESS I	BAT	11/30/2026	55.0	Pecos
24INR0455	Longfellow BESS II	BAT	11/30/2026	105.8	Pecos
24INR0493	Crowned Heron BESS 2	BAT	03/31/2026	154.2	Fort Bend
24INR0528	Blanquilla BESS	BAT	03/29/2027	200.8	Nueces
24INR0533	Padua Grid BESS Unit 2	BAT	03/31/2026	150.9	Bexar
24INR0584	Houston IV BESS	BAT	06/03/2026	164.6	Harris
25INR0018	Yellow Cat Wind	WND	04/01/2027	262.0	Navarro
25INR0199	Bonham Solar 1	SOL	04/06/2027	138.4	Limestone
25INR0229	OCI Cobb Creek Solar	SOL	12/31/2027	203.1	Hill
25INR0233	OCI Cobb Creek ESS	BAT	12/31/2027	201.6	Hill
25INR0391	Purple Sage BESS 1	BAT	05/30/2027	156.0	Collin

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
25INR0392	Purple Sage BESS 2	BAT	05/30/2027	156.0	Collin
26INR0034	Bracero Pecan Storage	BAT	07/01/2027	232.0	Reeves
26INR0296	Sherbino II BESS SLF	BAT	02/09/2027	77.4	Pecos
26INR0543	Three Canes Solar SLF	SOL	07/31/2027	333.0	Navarro
28INR0024	Padua Grid BESS Unit 3	BAT	05/15/2026	201.4	Bexar

Table A.3: Project Related Document

No	Document Name	Attachment
1	STEC Nueces Green Ammonia Load Interconnection Project	 STEC RPG Nueces Green Ammonia Load

Appendix A.2:

Sample plots demonstrating acceptable responses to system contingencies for the recommended option (Option 3) are shown below:

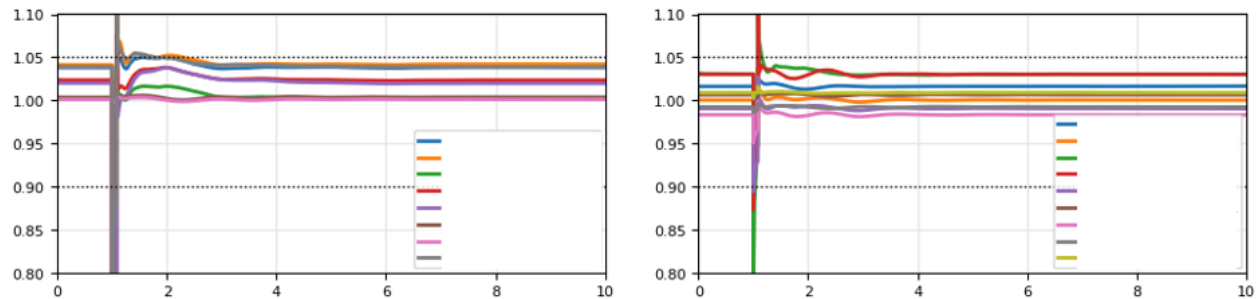


Figure A.2.1: Example Voltage Plots for P1 Event

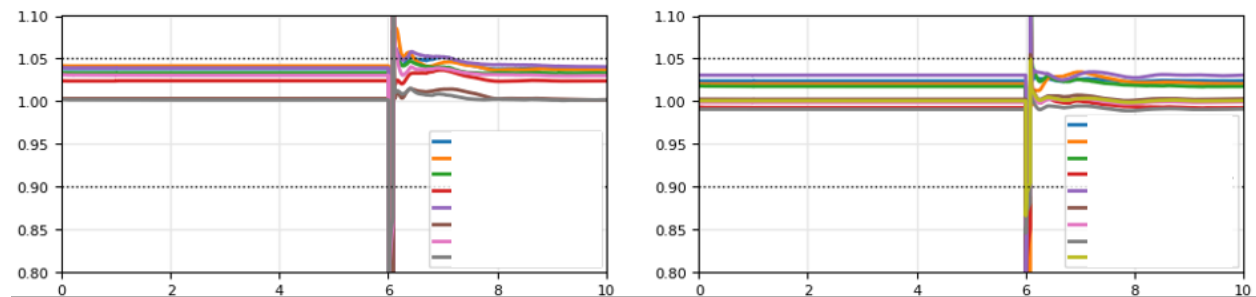


Figure A.2.2: Example Voltage Plots for P6 Event

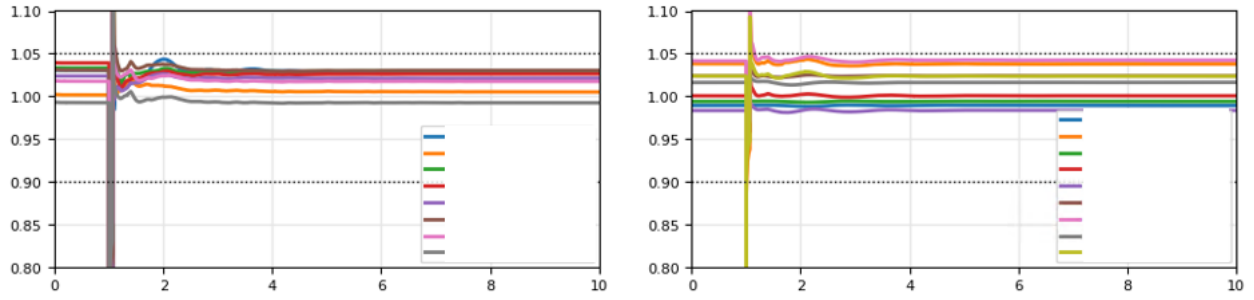


Figure A.2.3: Example Voltage Plots for P7 Event